EUROPEAN COMMISSION
Information Society and Media Directorate General

Lisbon Strategy and Policies for the Information Society
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Use of Computers and the Internet in Schools in Europe 2006

Country Brief: Estonia

6 / 2006

Key findings

(Almost) all Estonian schools are equipped with computers and internet connection. A very high 95% use the internet via a broadband connection. With this figure Estonia ranks at the top in Europe together with Denmark and Malta. There is hardly any variation between school types since it is close to the 100% in all school types, with the exception of vocational schools remaining at 87%.

A rather low 60% of Estonian classroom teachers (the EU25 average is 74%) had used computers in class in the 12 months prior to the survey, with some variation across school types. Teachers in vocational schools use computers in class much more frequently than their colleagues in general education with a very high (almost 70%) of teachers using computers in more than a quarter of their lessons, of which 58% use ICT in more than 50% of the lessons.

While a third of the teachers with up to 5 years teaching experience use ICT in half and more of their lessons, this figure is down to just 6% among those with more than 20 years of teaching experience.

A very high 40% of teachers do not use computers in class in Estonia. Asked for the most important barrier, 53% state a lack of computers in their schools as an important barrier.

At the same time virtually all schools are equipped with at least some computers in Estonia, so that the above statement suggests some scope for further ICT-infrastructure improvements in Estonian schools such as an increase of the number of computers in total and per pupil where Estonia ranks below the European average. Overall, the statement "lack of equipment in school" is expressed by a high 21% of all Estonian teachers (40% non-users multiplied with 53% of teachers agreeing to this item).

Interestingly, not being convinced of any benefits of using computers in class and the opinion that teachers lack the necessary skills to utilize computers in their teaching only receive few responses. This shows that the overall attitude towards the use of ICT in class is positive and that the majority of teachers are sufficiently competent in its use as part of the teaching process.

The same applies to the language skills of Estonian teachers. Unlike many other European teachers they do not seem to have problems in finding adequate material or with the language in which this is offered. The former is only criticised by 6% of Estonian teachers – as opposed to the EU25 average of 20%. "Lack of content in national language" is even less of an issue: less than 2% claim this to be an issue, while at the overall European level this figure is five times as high.

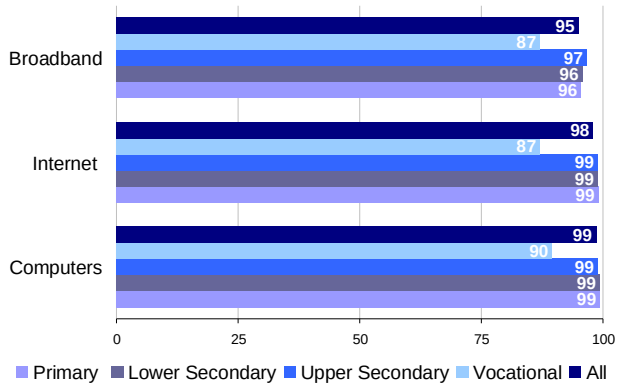
ICT Equipment and Internet in Schools

Almost all Estonian schools now use computers for teaching and have internet access. 95% use the internet via a broadband connection. With this figure Estonia together with Denmark and Malta ranks at the top of the 27 countries participating in the survey. There is hardly any variation between school types since it is close to the 100%, with the exception of vocational schools remaining at 87%.

A high 87% of schools have a website, 70% offer e-mail to teachers but only 18% do so to pupils. Only 28% of the Estonian schools using computers for teaching use them in classrooms with the highest percentage being achieved in vocational schools (40%). ICT is mostly used as part of teaching in computer labs (91%) which seems to be the typical case in the new member states.

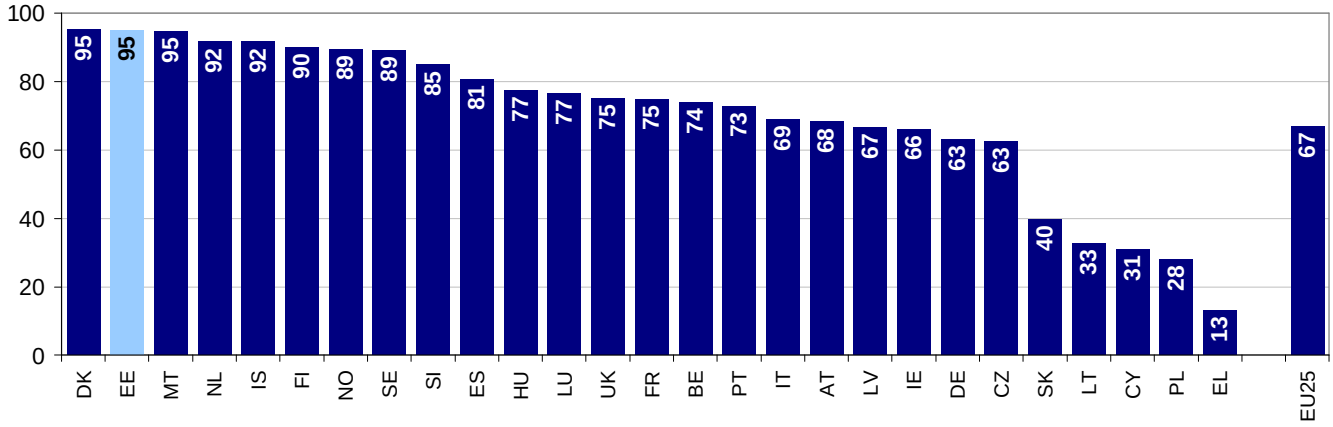
Computers in the school library are also more widely used in vocational schools (57% as opposed to approximately one third in all other school types).

Percentage of Schools Using Computers, Internet Connection, and Broadband Internet Access According to School Type in Estonia 2006



Source: *LearnInd HTS 2006;* ***Base:*** *All schools;* ***Question:*** *Computers: Q6; Internet, Broadband: Q9. See questionnaire for exact wording.* ***NOTES*** ***) Please note that HTS data for Estonian vocational schools is based on only 34 responses.*

Percentage of Schools with Broadband Internet Access in Europe 2006



Source: *LearnInd HTS 2006;* ***Base:*** *All schools;* ***Question:*** *Q9. See questionnaire for exact wording.*

ICT equipment in Estonian schools 2006

				Educational Level (EE)				Type of locality (EE)		Internet Access (EE)	
	Total EE	Total EU25	Total NMS10	Primary	Lower secondary	Upper secondary	Vocational	Densely populated and intermediate	Thinly populated	Narrow-band	Broadband
Computers per 100 pupils [a]	7.3	11.3	7.1	6.1	6.0	6.4	*14.1**	6.7	7.8	*8.6**	7.3
... of which internet connected	7.2	9.9	6.4	6.1	5.9	6.4	*13.8**	6.7	7.7	*8.5**	7.2
Percentage of schools having...											
Computers for teaching [b]	98.6	98.7	96.7	99.4	99.3	99.0	*89.6**	95.8	99.7	*100.0**	100.0
Internet access [c]	98.1	96.2	94.7	99.1	98.9	99.0	*87.0**	94.0	99.7	*100.0**	100.0
Broadband internet access [d]	95.0	66.9	43.4	95.6	95.7	96.7	*87.0**	94.0	95.5	*0.0**	100.0
A website [e]	87.1	63.0	66.7	87.3	93.9	96.9	*80.7**	90.4	85.8	*82.3**	89.0
An e-mail address for the majority of teachers [f]	69.8	65.2	48.1	68.8	72.8	80.5	*72.6**	72.7	68.6	*75.3**	71.0
An e-mail address for the majority of pupils [g]	17.5	23.5	24.4	15.2	16.8	23.1	*42.2**	26.2	14.0	*16.0**	17.9
A LAN [h]	72.0	55.2	60.4	73.9	75.6	66.2	*61.5**	57.8	77.7	*73.3**	73.5
An intranet [i]	17.1	40.8	26.9	13.2	15.3	28.9	*44.1**	31.3	11.5	*7.8**	17.7
An external support or maintenance contract [j]	32.3	47.1	44.3	34.8	29.1	20.2	*17.2**	28.7	33.6	*33.3**	32.9
Percentage of schools using computers for education in…											
Computer labs [k]	91.4	80.5	94.6	91.3	96.8	98.5	*93.0**	95.4	89.9	*82.3**	91.9
Classrooms [l]	27.9	61.4	29.5	27.6	25.3	28.2	*40.5**	31.2	26.7	*41.5**	27.4
School library [m]	34.4	33.4	36.8	31.7	35.5	57.3	*65.1**	51.7	27.9	*41.6**	34.4
Other locations accessible for pupils [n]	24.7	27.0	20.2	22.3	22.6	29.6	*51.7**	27.2	23.8	*41.9**	24.3

Source: *LearnInd HTS 2006;* ***Base:*** *a: all pupils; b-j: all schools, k-n: schools using computers for educational purposes for pupils (cf. index b);* ***Question:*** *a: Q4, Q6, Q7; b: Q6; c: Q9; d: Q9; e-j: Q12; k-n: Q8. See questionnaire for exact wording.* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

Those schools with a broadband connection to the internet are much more likely to have a more sophisticated ICT infrastructure including a school website, the use of a LAN or the availability of an intranet.

The use of Computers and the Internet in Schools

Computers are used for various purposes and as part of teaching different subjects in schools but also and very widely as a separate subject.

Computer sciences are taught as a separate subject in more than 80% of the primary, lower secondary and vocational schools and in 95% of the upper secondary schools, according to the statements made by Estonian head teachers.

A rather low 60% of Estonian classroom teachers (the EU25 average is 74%) had used computers in class in the 12 months prior to the survey, with some variation across school types. Primary (61%) and lower secondary school teachers (62%) seem to be the more frequent users of ICT in schools as opposed to upper secondary (53%) and vocational school teachers (47%).

For most teachers, this includes not only using a computer for presentation purposes but also the use of computers by pupils in class.

A majority (59%) of these teachers using computers use them in less than 10% of all lessons. Only 16% state that they use computers in more than half of their lessons. Teachers in vocational schools use computers in class much more frequently than their colleagues in general education with a very high (almost 70%) using computers in more than a quarter of their lessons, of which 58% use ICT in more than 50% of the lessons.

Use of computers in class in Estonia 2006

Assessments of the head teacher		Total EE	Total EU25	Total NMS10	Educational Level (EE)				Type of locality (EE)		Internet Access (EE)	
					Primary	Lower secondary	Upper secondary	Vocational	Densely populated and intermediate	Thinly populated	Narrow-band	Broadband
Computer sciences taught as separate subject	Agree	84.0	54.7	91.2	83.6	89.3	95.2	*84.3**	80.5	85.4	*74.2**	84.5
	Disagree	15.7	43.7	8.4	16.1	10.3	4.8	*15.7**	19.5	14.3	*25.8**	15.3
	Don't know	0.2	1.6	0.4	0.3	0.3	0.0	*0.0**	0.0	0.3	*0.0**	0.3
Computers and the internet are												
integrated into teaching of most subjects	Agree	82.4	75.3	73.1	82.2	84.7	86.2	*81.4**	82.1	82.5	*65.7**	82.8
	Disagree	17.4	24.1	26.4	17.5	15.0	13.3	*18.6**	17.9	17.2	*34.3**	17.0
	Don't know	0.2	0.6	0.4	0.3	0.3	0.5	*0.0**	0.0	0.3	*0.0**	0.2
used for teaching traditional subjects or basic skills	Agree	57.7	75.8	72.3	65.7	61.5	47.4	*3.5**	46.3	62.0	*40.5**	58.2
	Disagree	40.0	22.8	26.0	32.5	36.5	47.9	*86.5**	49.1	36.5	*50.6**	39.6
	Don't know	2.4	1.4	1.7	1.8	2.0	4.7	*10.0**	4.5	1.5	*8.9**	2.2
used for teaching foreign languages	Agree	85.2	56.6	71.1	85.7	87.5	92.3	*76.7**	89.8	83.4	*48.6**	86.3
	Disagree	13.4	40.1	28.0	13.1	11.5	6.5	*19.2**	9.0	15.1	*42.4**	12.6
	Don't know	1.4	3.3	0.8	1.2	1.0	1.2	*4.1**	1.2	1.4	*8.9**	1.1
used for coping with students with special needs/ handicaps	Agree	20.3	71.7	58.3	19.3	19.2	24.3	*35.6**	25.8	18.2	*8.2**	20.8
	Disagree	66.6	23.7	31.6	67.7	69.2	67.6	*48.1**	61.8	68.4	*75.5**	66.4
	Don't know	13.1	4.6	10.1	13.0	11.6	8.1	*16.4**	12.5	13.4	*16.3**	12.8

Source: *LearnInd HTS 2006;* ***Base:*** *All schools using computers for educational purposes for pupils;* ***Question:*** *Q13: "To what extent do you agree or disagree with the following statements regarding the educational use of computers and/or the internet in your school?"* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

Estonian teachers using computers do not restrict themselves to a particular source of information but use a multitude of different material from a variety of sources for teaching purposes which in most categories is above the European average. They are also very active (97%) in searching for material themselves in the internet. This shows a very proactive behaviour.

Again, a very high 87% of teachers each use prefabricated pedagogical material from existing online sources and 65% material that is made available on the schools' network and databases. Offline learning materials such as CD-ROMs are used by 72%.

There are hardly any differences in ICT usage intensity of teachers according to age up to the level of 50% of their lessons. Beyond that, and not surprisingly, the older the teachers (indicator used here: years of teaching experience), the less use they make of computers and the internet in schools. While a third of the teachers with up to 5 years teaching experience use ICT in half and more of their lessons, this figure is down to just 6% among those with more than 20 years of teaching experience.

A very high 40% of teachers do not use computers in class in Estonia. When asked for the most important barrier, 53% state a lack of computers in their schools as an important barrier.

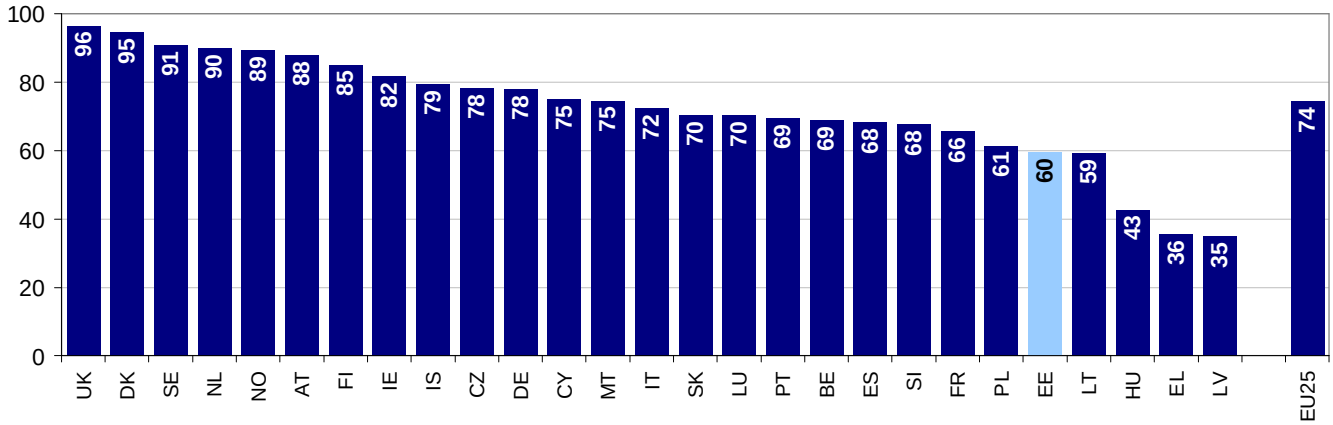
At the same time virtually all schools in Estonia are equipped with at least some computers, so that the above statement suggests some scope for further ICT-infrastructure improvements at Estonian schools such as an increase of the number of computers in total and per pupil where Estonia ranks below the European average.

Overall, the statement “lack of equipment in school” is expressed by a high 21% of all Estonian teachers (40% non-users multiplied with 53% of teachers agreeing to this item).

Interestingly, not being convinced of any benefits of using computers in class and the opinion that teachers lack the necessary skills to utilize computers in their teaching only receive few responses. This shows that the overall attitude towards the use of ICT in class is positive and the majority of teachers sufficiently competent in its use as part of the teaching process.

The same applies to the language skills of Estonian teachers. Unlike many other European teachers they do not seem to have problems in finding adequate material or with the language in which this is offered. The former is only criticised by 6% of Estonian teachers – as opposed to 20% as the EU25 average. “Lack of content in national language” is even less so an issue: only less than 2% claim this to be an issue, while at the overall European level this figure is five times as high.

Percentage of teachers who have used computers in class in the last 12 months (2006)



Source: *LearnInd CTS 2006;* ***Base:*** *All teachers;* ***Question:*** *Q7. See questionnaire for exact wording*

Teachers' use of computers in class in Estonia 2006

Percentage of teachers who …	Total EE	Total EU25	Total NMS10	Educational Level (EE)				Type of locality (EE)		Years of teaching experience (EE)			
				Primary	Lower secon-dary	Upper secon-dary	Voca-tional	Densely populated and intermediate	Thinly popu-lated	<5 y	5-9 y	10-19 y	20+ y
...have used computers in class[1]	59.7	74.3	61.3	60.9	61.5	53.3	46.8	53.8	62.0	52.9	63.1	63.5	57.5
…use a computer in class to present or demonstrate	51.1	63.4	55.5	51.6	52.5	46.8	46.8	48.0	52.3	48.4	58.4	53.6	47.2
…have pupils use a computer in class	52.3	66.3	53.8	54.2	54.2	42.9	34.8	43.0	56.0	43.5	55.8	56.6	50.6

Source: *LearnInd CTS 2006;* ***Base:*** *All teachers;* ***Question:*** *Q7 "How have you used computers and/or the internet for work in the last 12 months?"* ***Notes***

Frequency of computers use in class Estonia 2006

Percentage of all teachers *using computers in class* who …	Total EE	Total EU25	Total NMS10	Educational Level (EE)				Type of locality (EE)		Years of teaching experience (EE)			
				Primary	Lower secon-dary	Upper secon-dary	Voca-tional	Densely popula-ted and inter-mediate	Thinly popu-lated	<5 y	5-9 y	10-19 y	20+ y
…use computers in 5% and less of all lessons	34.7	18.5	15.0	37.4	36.8	30.1	*3.2**	21.7	39.1	31.3	26.8	30.4	42.5
in 6 to 10% of lessons	24.1	22.5	17.7	24.6	24.1	20.5	*19.3**	24.2	24.1	18.4	20.8	26.5	25.3
in 11 to 24% of lessons	14.7	22.2	22.1	15.0	15.5	12.8	*9.6**	11.7	15.7	11.2	9.5	15.7	17.2
in 25 to 50% of lessons	10.7	20.2	24.0	11.1	11.1	12.2	*9.8**	17.0	8.6	6.9	14.3	11.7	9.5
more than 50% of lessons	15.8	16.5	21.3	11.9	12.6	24.2	*58.1**	25.3	12.5	32.3	28.6	15.7	5.5

Source: *LearnInd CTS 2006;* ***Base:*** *Teachers using computers in class, "don't know" answers excluded;* ***Question:*** *Q9 "For what percentage of time have you used computers and/or the internet in class when teaching your main subject(s) in the past 12 months?"* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

Source of educational material used in class in Estonia 2006

Percentage of all teachers *using computers in class*[2] who …	Total EE	Total EU25	Total NMS10	Educational Level				Type of locality	
				Primary	Lower secondary	Upper secondary	Vocational	Densely populated and intermediate	Thinly populated
…use material they have searched the internet for	96.7	82.7	81.8	96.7	97.1	97.3	*96.8**	94.0	97.6
…use existing online material from established educational sources	86.5	74.2	61.8	89.1	88.9	83.8	*58.0**	82.8	87.8
…use material that is available on the school's computer network or database	65.4	63.1	52.7	67.4	68.0	67.6	*41.9**	62.4	66.5
…use electronic offline material (such as CD ROMS)	72.2	83.0	82.2	73.1	71.9	71.7	*61.6**	70.5	72.8
…use other learning material when using computers in class	2.2	8.8	10.8	2.0	2.1	1.9	*6.4**	2.4	2.1

Source: *LearnInd CTS 2006;* ***Base:*** *Teachers using computers in class;* ***Question:*** *Q10 "Which of the following types of materials have you used when teaching your main subject(s) with the aid of a computer and/or the internet?"* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

Barriers to computer use in class in Estonia 2006

Percentage of all teachers ***not*** *using computers in class*	Total EE	Total EU25	Total NMS10	Educational Level				Type of locality	
				Primary	Lower secondary	Upper secondary	Vocational	Densely populated and intermediate	Thinly populated
Lack of computers	52.9	48.8	49.0	52.4	49.2	59.1	*62.8**	53.9	52.5
Lack of adequate content/material	6.1	20.3	16.5	5.7	6.5	5.4	*8.6**	3.6	7.2
Lack of content in national language	1.7	8.6	5.7	1.3	1.8	2.1	*2.8**	0.0	2.5
Lack of adequate skills of teachers	10.8	22.5	9.8	10.9	12.1	10.1	*11.5**	8.1	12.1
No or unclear benefits	8.7	16.2	6.8	7.7	8.5	9.2	*14.4**	9.1	8.4
Lack of interest of teachers	2.1	8.9	3.3	1.7	1.8	2.8	*5.9**	2.8	1.7
Subject does not lend itself to being taught via computers	23.2	24.4	25.0	25.0	26.3	20.0	*8.8**	20.5	24.4
Other	20.7	21.3	20.3	20.6	19.1	16.7	*22.9**	22.0	20.1

Source: *LearnInd CTS 2006;* ***Base:*** *all teachers not using computers in class;* ***Question:*** *Q12: "Why do you not use computers and/or the internet when teaching in class?"* ***Notes:*** *"xx.x*": based on at least 10 and less than 50 cases.*

Attitudes on the Usefulness of ICT use in Teaching

Computers and the internet have arrived in Estonia schools and their use is steadily improving. The share of teachers in Estonia – but also in the European Union in general – who believe that computers and the internet should not at all be used in schools, is very low and below 1%. Estonian teachers are positive towards the different purposes for ICT use in teaching and achieve high figures (above the European average) on attitudes that ICT should be used for letting pupils do exercises and practise (87%), letting pupils retrieve information in a self-directed manner (96%) and – to a lesser extent - for collaborative and productive work by pupils (72%). There are only small differences across school types. Only 41% of the Estonian teachers believe that teaching about office tools should be an integral part of the teaching process. With this figure, the country ranks significantly below the EU25 average figure. This attitude is most prominent among teachers in vocational schools (52%) and least prominent in primary schools (40%). It is interesting that there is no common pattern across the European countries. In some countries (e.g. the UK, Norway, Iceland, Cyprus but also Spain) teachers in primary schools express this opinion much more strongly and to a larger extent compared to higher-level schools.

Attitudes on the Usefulness of ICT use in Teaching in Estonia 2006

Percentage of teachers saying computers/internet should be used for …	Total EE	Total EU25	Total NMS10	Educational Level				Type of locality	
				Primary	Lower secondary	Upper secondary	Vocational	Densely populated and intermediate	Thinly populated
Letting pupils do exercises and practise	87.0	79.9	78.8	87.3	87.0	85.7	85.0	85.9	87.4
Letting pupils retrieve information in a self-directed manner	96.3	85.0	87.8	96.0	96.1	97.6	98.5	97.1	95.9
Teaching about office tools	40.6	61.3	51.0	39.5	40.9	46.7	51.6	48.1	37.5
Collaborative and productive work by pupils	72.0	80.5	67.2	71.2	74.3	77.8	79.0	75.2	70.7
Computer/internet should not be used for any of these in teaching	0.5	0.6	0.5	0.6	0.3	0.0	0.0	0.0	0.7

Source: *LearnInd CTS 2006;* ***Base:*** *all teachers;* ***Question:*** *Q13: "What do you think for what computers and the internet should be used for in teaching?"*

Access, Competence and Motivation for Using ICT and the Internet in Schools

Access

The majority of Estonian teachers are more or less satisfied with the technical access means at their schools: 71% state that their school is well equipped with computers and 81% express the opinion that their internet connection is fast enough. However, 66% wish there were better support and maintenance actions taken. In terms of content 19% state problems with respect to finding adequate learning materials and 39% argue that existing material are of poor quality.

Competence in using ICT

Estonian teachers feel most competent in using e-mail and using a text processor programme but are less confident with downloading and installing software and with using presentation software packages.

Primary school teachers (23%) seem to be less ICT competent than those in upper secondary (29%) and vocational schools (39%).

Motivation for ICT use in Schools

A high 91% of Estonian teachers see significant learning benefits for pupils using computers in class and say that pupils are more motivated and attentive when computers and the internet are used in class.

Teachers' access, competence and motivation for using ICT in class 2006

Percentage of teachers agreeing or strongly agreeing:	Total EE	Total EU25	Total NMS10	Educational Level				Subject of teaching					
				Primary	Lower secondary	Upper secondary	Vocational	General primary	Literature and languages	Humanities and social sciences	Science, maths, computer sciences	Physical, artistical, crafts education	Vocational education
Access													
Our school is well equipped with computers [a]	71.3	74.2	76.5	70.0	72.3	74.0	81.6	67.7	66.2	67.5	72.2	75.3	85.5
The internet connection we have is sufficiently fast [b]	81.1	77.2	78.2	79.7	80.9	85.8	89.1	80.0	83.8	82.4	79.9	79.8	80.2
Better technical maintenance and support is required in our school [c]	66.0	64.8	64.6	68.5	67.0	61.5	50.0	72.3	66.4	63.2	64.8	68.8	49.6
Existing teaching materials on the Internet are of poor quality [d]	18.5	29.9	29.3	17.6	18.6	22.7	28.9	18.5	16.6	16.7	18.9	19.0	20.5
It is hard to find adequate learning materials for teaching [e]	39.2	38.7	30.5	37.4	39.4	40.0	45.4	27.6	32.6	36.5	42.0	51.6	51.5
Motivation													
Pupils are more motivated and attentive when computers and the internet are used in class [f]	90.7	86.3	90.1	91.4	90.9	88.3	89.1	91.7	91.7	92.4	92.1	86.6	90.1
Using computers in class does not have significant learning benefits for pupils [g]	15.9	20.7	9.5	15.5	15.9	20.4	15.3	10.7	15.1	16.6	16.1	16.3	17.0
Competence													
Teachers in our school do not have sufficient computer skills [h]	24.9	42.0	30.6	23.5	24.0	29.0	39.4	17.1	19.6	31.5	28.1	29.4	30.7
Competence / computer skills (Percentage of teachers who feel very confident at…)													
Using text processors [i]	45.7	65.0	63.2	45.0	45.1	51.1	51.7	38.4	47.7	44.7	53.4	37.1	32.5
Creating electronic presentations [j]	31.1	34.0	41.0	30.1	29.9	34.4	48.4	26.9	20.9	27.9	43.2	29.8	27.6
Using e-mail [k]	81.0	65.9	64.8	80.4	80.5	88.1	90.4	72.6	84.0	70.9	85.2	78.9	83.2
Downloading and installing software [l]	21.8	35.8	34.6	20.4	21.7	28.0	32.1	15.1	12.1	21.9	33.8	14.6	0.0

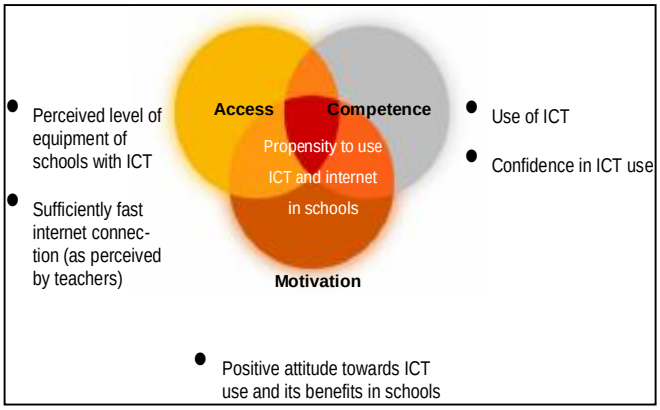
Source: *LearnInd CTS 2006;* ***Base:*** *a-h All teachers; i -l Teachers using computers in class* ***Question:*** *a-h Q14, i-l Q11.*

ICT Readiness of Teachers – the ACM Model

The ACM model as developed by Viherä and Nurmela (2001)[3] was applied in LearnInd to generate a typology according to the "propensity to the use of computers and internet by teachers in classroom situations at schools".

The typology in the figure below takes account of the three main categories of preconditions which need to be given for a school to make use of computers and the internet in the teaching process in classrooms, computer labs etc.

The Access-Competence-Motivation Model



These are: access (to computers and the internet at school), competence (in using the computer software and the internet, and applying it for teaching purposes), and motivation (gauged through the attitude that using computers in classrooms results in significant learning benefits).

Any attempt to group the classroom teachers according to their propensity to becoming users of computers and the internet in their teaching processes needs to take account of these three dimensions. In the present application of the ACM model data from the Classroom Teacher Survey (CTS) was used. Therefore "access" for instance is to be understood as a perceived level of computer equipment at schools and teachers' satisfaction therewith rather than an objective measure of equipment status.

38% of European teachers dispose of sufficient access to the internet at school, the necessary competence in using ICT in class and are motivated to its use. With 38% of the teachers belonging to this group, Estonia ranks at 8th which places the country almost in the top quarter of European countries. Overall the UK with 60% ranks top and Latvia with 15% finds itself at the very end.

The as yet insufficient internet connection in many schools and a lack of motivation of teachers for using ICT are the most critical issues for a wider uptake of computers and the internet in schools in Europe. 20% of European teachers indicate insufficient computer equipment and the low speed of internet connection at their school as key barriers. 14% show a lack of motivation, i.e., they are of the opinion that using computers in class does not result in significant learning benefits.

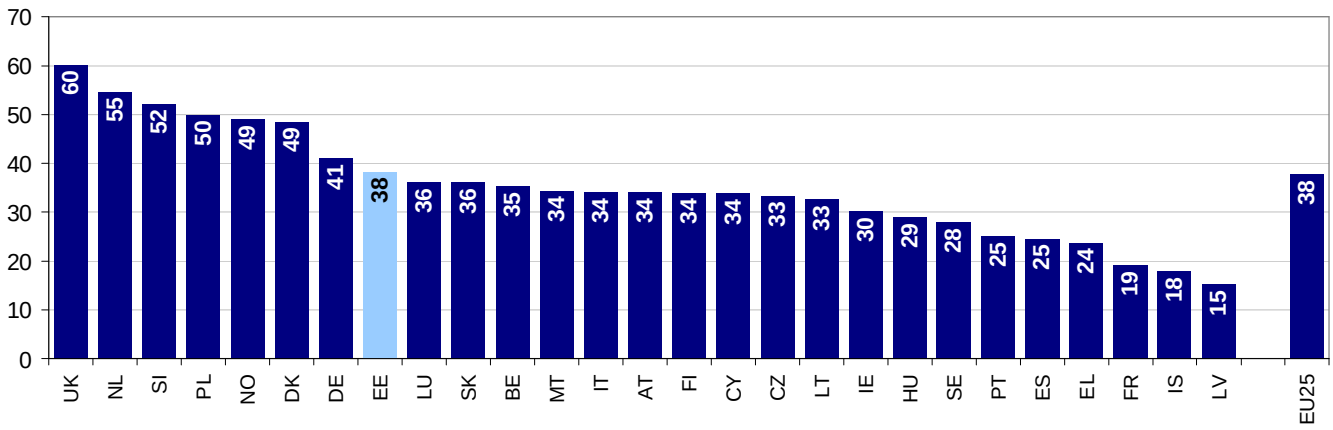
The situation in Estonia is similar to the overall situation in the EU25 regarding lack of internet access and ICT equipment and with 24% even higher than the average European one.

Access, Motivation and Competence of Teachers for Using ICT in Schools in Estonia 2006

EE	EU25	Access	Competence	Motivation
3.9	4.3	~~Access~~	~~Competence~~	~~Motivation~~
4.2	3.9	**Access**	~~Competence~~	~~Motivation~~
6.3	9.7	~~Access~~	**Competence**	~~Motivation~~
5.9	5.0	~~Access~~	~~Competence~~	**Motivation**
10.0	13.7	**Access**	**Competence**	~~Motivation~~
7.8	4.8	**Access**	~~Competence~~	**Motivation**
23.5	20.7	~~Access~~	**Competence**	**Motivation**
38.3	37.9	**Access**	**Competence**	**Motivation**
100	100			

Percentage of teachers. ***Source:*** *LeanInd CTS 2006;* ***Base:*** *All teachers;* ***Question:*** *See endnote* [4]

ICT Readiness of Teachers in Estonia: Percentage of Teachers Fully Ready to use Computers in Class (ACM Indicator) 2006



Source: *LeanInd CTS 2006;* ***Base:*** *All teachers.* ***Question:*** *See endnote 5*

ANNEXES

Methodology Report

Universe / Sample population

In order to assure the comparability of school levels in all countries UIS-OECD-EUROSTAT "Mapping of national education programmes to ISCED 97 for school academic/year 2002/2003" [5] was used for composing the sample frame. Based on this, each country divided its school system into ICSED codes and made different combinations that existed in its country.

Sampling frame and method

The sample was composed using official databases, which contained contact data of schools. In the majority of countries the sample was drawn from a database received from the Ministry of Education.

For each country a separate template of sample frames was composed by TNS Emor. These templates contained data about school types across regions as well as location type. School types were defined based on the ISCED codes provided in UIS-OECD-EUROSTAT. Location type distribution was made according to the Eurostat type of locality classification which differentiates densely populated, intermediate and thinly populated municipalities[6]. Apart from that, each country was divided into 3-7 regions depending on the size of a country.

Based on the data provided by countries, TNS Emor composed quotas for each country. Two level stratification was used – quotas for first stage, random sample for second. The quotation for region by school type and location type was endorsed. Simple random selection was conducted by the local agency or the local source of the contact base. Both private and public schools were included in the sample. It was also obligatory to include schools of other teaching languages than the official language of a country in the sample.

Simple random sampling was used inside a quota cell. This means that if the quota for primary schools in region1 was 100 and the total number of primary school in this region was 800, then a random sample selection was be made among those 800 schools. This covered also both private and public schools and schools of other teaching languages than the official language of a country.

No more than 50% of interviews could be made in one school level. At least 10% of respondents had to be from schools, which provided professional/vocational or combined programme of vocational and upper secondary level education (in case a country did not have special quota for those schools). It did not matter whether vocational education level was coded as ISCED 3 or ISCED 4.

There were no duplications in samples of head teacher and classroom teacher surveys. This was only allowed in countries with small universe sizes (e.g. Malta, Cyprus, Iceland, Estonia, Latvia etc) and in cases where the last quota cells were very difficult to achieve or there were not enough schools of a certain type. The priority was to include as many different schools as possible. In both surveys, 5 attempts were made before giving up and only if the respondent refused was this person not contacted again.

The CATI programme generated a randomly chosen letter. The interviewer asked for the person with a surname that started on the generated letter. If there was more than one teacher whose surname started with the selected letter, the person who was first alphabetically was chosen. If the correct person was not available, an appointment was made. At least 5 attempts were made before taking another teacher.

Only in Malta, due to instructions dictated by the Education Department, would the Head Teacher randomly select a teacher who would be available for an appointment during which they would be interviewed.

Number of interviews conducted (HTS / CTS)

Country		Head Teachers	Classroom teachers
BE	Belgium	450	807
CZ	Czech Republic	500	1000
DK	Denmark	315	848
DE	Germany	450	901
EE	Estonia	400	851
EL	Greece	500	1000
ES	Spain	518	1022
FR	France	501	869
IE	Ireland	403	626
IT	Italy	500	900
CY	Cyprus	150	600
LV	Latvia	451	902
LT	Lithuania	457	908
LU	Luxemburg	82	277
HU	Hungary	500	1000
MT	Malta	100	200
NL	Netherlands	515	890
AT	Austria	320	450
PL	Poland	500	1000
PT	Portugal	450	900
SI	Slovenia	253	460
SK	Slovakia	502	1000
FI	Finland	318	601
SE	Sweden	200	450
UK	United Kingdom	450	905
IS	Iceland	177	424
NO	Norway	494	708
TOTAL		**10456**	**20499**

Fieldwork

Fieldwork was coordinated by the TNS Emor and conducted in cooperation with its local TNS offices excluding Iceland, Cyprus, Austria, Slovenia and Malta where TNS does not have offices. In these countries partners with whom TNS has previous experience were used.

Pilot interviews prior to the regular fieldwork were conducted with 20 schools in both target groups in Estonia and Greece in February 2006, in order to test the questionnaire (structure, comprehensibility of questions).

Between March and April 2006, surveys among head teachers (head teacher survey - HTS) and classroom teachers (CTS) were carried out in 27 European countries. TNS Emor was responsible for the fieldwork.

Weighting schemes

After the fieldwork, weighting coefficients were computed using region, location type and school type.

Statistical accuracy of the survey: confidence intervals

Statistics vary in their accuracy, depending on the kind of data and sources. A "confidence interval" is a measure that helps to assess the accuracy that can be expected from data. The confidence interval is the estimated range of values on a certain level of probability of error. Confidence intervals for estimates of a population fraction (percentages) depend on the sample size, the probability of error, and the survey result (value of the percentage) itself. Further to this, variance of the weighting factors has negative effects on confidence intervals.

The calculation of confidence intervals is based on the assumption of (quasi-) infinite population universes. In practice, however, in some country and for some school levels the complete population of schools consists of only several hundred or even a few dozen of schools. In some cases, literally each and every school within a country-school type cell was contacted and asked to participate in the survey. This means that it is practically impossible to achieve a higher confidence interval through representative school surveys in which participation is not obligatory.

Country Background Data

With a GDP per Capita of 12,379 US$, Estonia belongs to the poorest countries of the European Union. Nonetheless, the GDP Growth rate exceeds the comparative value of every other Member State. Life expectancy in Estonia is the lowest in Europe, and the infant mortality rate is extraordinarily high on an international scale.

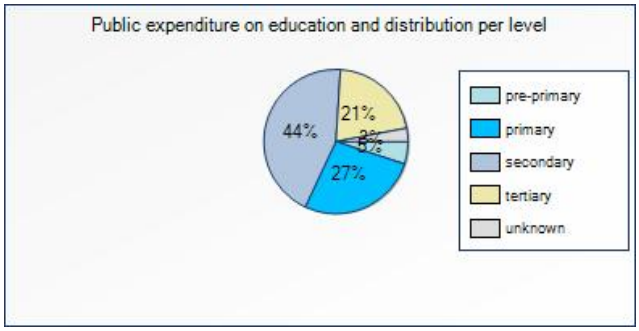
General Population Data for Estonia 2002/03[7]

Total population (000)	1,338
Annual population growth rate (%)*	-0.4
Population 0-14 years (%)	17
Rural population (%)*	31
Total fertility rate (births per woman) *	1.4
Infant mortality rate (0/00) *	8
Life expectancy at birth (years) *	71
GDP per capita (PPP) US$ *	12,379
GDP growth rate (%)*	7.2
* World Bank World Development Indicators	

Resources for Education in Estonia 2002/03

Pupil / teacher ratio (primary)	14
Public expenditure on education :	
as % of GDP	5.7
as % of total government expenditure	
Distribution of public expenditure per level (%):	
pre-primary	5
primary	27
secondary	44
tertiary	21
unknown	3

Resources for Education in Estonia 2002/03



The Educational System in Estonia[8]

In 1 January 2003, the number of people aged 29 or under was 522,714 (38.5% of the population). In 1 January 2003 the number of children of compulsory school age (7-16 years old) was 167,948. The language of instruction is Estonian or Russian. At the beginning of the academic year 2004/05 there were 519 Estonian-medium basic schools and gymnasiums, 85 Russian-medium basic schools and gymnasiums and 21 schools with Estonian- and Russian-medium classes; in vocational education, there were Russian-medium groups for 34.6% of all pupils in 2003/2004 academic year and in higher education the language of instruction was Estonian for 87.4% of students, Russian for 10.6%, and English for 2%.

Most pupils attend public-sector schools which are funded by the State: in the 2003/04 academic years 95.9% of pupils attended municipal schools, 2.1% state schools and 2% private schools. Private schools are owned by private physical or legal entities. Costs for teacher salaries and textbooks are covered by the state budget; students who attend private schools must pay fees. All out-of school activities and project work beyond compulsory curricula in state, municipal and private schools are expected to be funded by local government or parents.

National standards for education at different levels are set by the Government of the Republic, *(Vabariigi Valitsus)*. The Ministry is responsible for the development and implementation of educational policy and supervises basic and secondary schools at national level. The county governments *(maavalitsus)* provide regional-level supervision of pre-school childcare institutions and schools, and some guidance and counselling while the local governments *(vallavalitsus*, *linnavalitsus)* maintain pre-primary childcare institutions, basic and secondary schools.

Authorities responsible for school inspection are the monitoring department *(järelevalve osakond)* at the Ministry

of Education and Research and inspectors in the educational departments of county governments.

The use of ICT in Education[9]

In order to implement ICT in general education, a development plan for the years 2006-2008 has been completed that applies to all students and teachers to facilitate access to ICT. There are published e-study materials highly evaluated by the teachers and students, support is given for the regulation of teaching and an evaluation system for heads of schools and teachers, and web-oriented studying is implemented.

The programme is implemented under the leadership of a private foundation. In addition to state funding, human and financial resources of schools, local governments, private structures and international organisations provide the financial base for the implementation process. The main interface between the programme for Education and Training 2010 and the Copenhagen declaration is contributing to the use of ICT.

Virtual mobility in general education is supported primarily by an up-dated curriculum, as a result of the development of curricula, in which use of ICT in studies is one of the priorities. Much emphasis is placed on ICT skills included in the competence list of the framework requirements of teacher training or professional standard

The Study

There is a lack of information on the actual use of ICT for learning in schools and for supporting political action in potential future programmes. It is necessary to clarify matters such as the educational vision of heads of schools, the current impact of ICTs on teachers' practice, support and training and on other factors for success in e-learning.

The objective of the study is to obtain estimates for the eEurope 2005 indicator on e-learning "number of pupils per computer with Internet connection (broadband/non-broadband)" and relate it to other possible indicators of educational use of ICT in compulsory education (e-learning in schools). The study looks at how Information and Communication Technologies (ICT) are used in schools.

The study is a continuation of the earlier benchmarking exercise for eEurope 2002.

It involved two surveys. Firstly of head teachers to obtain information on the schools and then of teachers to focus on their use of ICTs in the teaching process

This exercise is part of the Information Society monitoring and benchmarking process for which the Commission in cooperation with the Council defined benchmarking indicators.

Country Briefs

This document has been prepared by **empirica** based on own desk research and the above mentioned primary data sources: Head Teacher Survey (HTS) 2006 and Classroom Teacher Survey (CTS) 2006 in the EU25 member states, Iceland and Norway.

Altogether 27 LearnInd Country Briefs are available in a common format, one for each member of the enlarged European Union, Norway and Iceland.

A final report has also been developed. It includes approximately 100 exhibits, more than 250 data tables and a report about the key results.

You can access and download these documents in PDF format (for free) from http://ec.europa.eu/information_society/eeurope/i2010/benchmarking/index_en.htm.

More information

Check our results and achievements on: http://ec.europa.eu/information_society/eeurope/i2010/benchmarking/index_en.htm. If you wish to be provided with more details, or to receive news and updates, please contact us at: **learnind@empirica.com** or get in touch with us.

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1 Note that "in class" means during lessons while teaching and does not denote a particular location such as a classroom.

2 Base (100%) = all teachers who have used a computer in class in the last 12 months.

3 Viherä, M-L, Nurmela, J (2001) "Communication Capability Is an Intrinsic Determinant for Information Age", in Futures, Volume 33, Issue 3-4:245-265.

4 Synthetic indicators: Access: Q14 (2) "Our school is well equipped with computers" and Q14 (3) "The internet connection we have is sufficiently fast ".

Competence: Q11 How confident do you feel... a) using a text processor, b) creating a presentation c) using e-mail, d) downloading and installing software. Threshold: Average of 2.5 or more on a 1-4 confidence scale

Motivation: Q14 (8); disagree to "Using computers in class does not result in significant learning benefits".

For full question wordings refer to questionnaire.

5 http://forum.europa.eu.int/Public/irc/dsis/edtcs/library?l=/public/unesco_collection/programmes_isced97&vm=detailed&sb=Title

6 Densely populated area refers to a set of closely related local units, each one of which having a density greater than 500 inhabitants per km2, and the total population of which being of at least 50 000 inhabitants; Intermediate area refers to a set of closely related local units that do not pertain to a densely populated area, each one of which having density greater than 100 inhabitants per km2, and where the total population is at least of 50 000 inhabitants or it refers to a set that is adjacent to a highly populated area. Thinly populated area (rural): refers to a set of closely related local units that are not part of a densely populated area, or of an intermediate area. (A set of local areas totalling less than 100 km², not reaching the required density, but entirely enclosed within a densely-populated or intermediate area, is to be considered to form part of that area. If it is enclosed within a densely-populated area and an intermediate area it is considered to form part of the intermediate area).

7 Source: http://www.uis.unesco.org/profiles/selectCountry_en.aspx (visited 28 March 2006)

8 Source: http://www.eurydice.org/Documents/struct2/frameset_EN.html (visited: 28 March 2006)

9 Source: http://europa.eu.int/comm/education/policies/2010/nationalreport_en.html (visited: 9 May 2006)